HARTLIB — THE REFORMED VIRGINIAN SILK-WORM — LOND. 1655

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BOUND BY SANGORSKI & SUTCLIFFE.LONDON

[Hartlib, Samuel] "

THE REFORMED VIRGINIAN SILK-WORM,

Or, a Rare and New

DISCOVERY

OF

A ſpeedy way, and eaſie means, found out by a young Lady in *England*, ſhe having made full proof thereof in *May*, *Anno* 1652.

For the feeding of Silk-worms in the Woods, on the Mulberry-Tree-leaves in *Virginia*: Who after fourty dayes time, preſent their moſt rich golden-coloured ſilken Fleece, to the inſtant wonderful enriching of all the Planters there, requiring from them neither coſt, labour, or hindrance in any of their other employments whatſoever.

And alſo to the good hopes, that the *Indians*, ſeeing and finding that there is neither Art, Skill, or Pains in the thing: they will readily ſet upon it, being by the benefit thereof inabled to buy of the *Engliſh* (in way of Truck for their Silk-bottoms) all thoſe things that they moſt deſire.

LONDON,
Printed by *John Streater*, for *Giles Calvert* at the *Black-Spread-Eagle* at the Weſt end of *Pauls*, 1655.

TO THE Reader.

Ingenious Reader,

I Have in my Legacy of Husbandry bequeathed some-thing unto thee concerning Silk-worms, which hath wake-ned many to search after the means to advance that part of Husbandry. But because the Letter of King Iames *to the Lords Lieutenants of the severall Shires of* England, *for the increasing of Mulberry Trees, and the breeding of Silk-worms, for the making of Silk in this Nation, had not annexed unto them in that Treatise the Instructions ten-ding to that purpose, and being but few, wholly out of print, and very much desired: I thought good upon the occasion of the printing of this Letter to those of* Virginia, *to publish it also for the benefit of those who shall be willing to employ themselves in this way of industry, which seemeth to be brought unto a more perfect and speedy accomplishment than heretofore hath been known either here or in* France, *as by the contentes of this adjoyned Letter (wherein the Experi-ment of a vertuous Lady of this Nation for the breeding of Silk-worms, is addressed unto the Planters of* Virginia) *is set forth to encourage both them and others to set upon this work, to benefit themselves and the Nation thereby. And truly the Gentleman who doth addresse this Letter to the Planters of the Virginian Colonie is much to be commended for his affection to the publick, because he doth not conceal (as some Muck-worms do for private ends) the Advantages*

which may be reaped by ſingular induſtrious Attempts or experiments of profit; but deſires the benefit of others, even of all, to be encreaſed. And it were to be wiſhed, that every one to whom God (from whom comes every good & perfect gift) doth impart any rare and profitable Secret of Induſtry, would open himſelfe towards his Brethren, as this publick-hearted Gentleman doth; then would all hands be ſet a work, and every one would become inſtrumentall to ſerve himſelfe and his Neighbours in Love, and overcome the burthen of povertie, which for want of employment and decay of Trade, doth lie ſo heavie upon very many, whoſe burthens might be either born, or made eaſie, if all the gifts of God were made uſe of, for the end for which he doth beſtow them, namely, to profit withall towards others, as it becommeth the Members of the ſame Chriſtian, and Human, and Nationall Society; for the ſame rule holds in all theſe reſpects among ſuch as underſtand what it is to be a good Commonwealths-man in the State, as well as in the Communion of Saints: And to this good and generous inclination, which I wiſh may more and more abound in them with the grace of God, I ſhall leave thee and reſt,

Thy moſt aſſured and faithfull ſervant,

SAMUEL HARTLIB.

Inſtructions

Instructions *for the increase and Planting of* Mulberry-trees.

What ground is fit for the Mulberry-seeds, *how the same is to be ordered, and in what sort the seeds are to be sowed therein.*

THe ground which ought to be apointed for this purpose, besides the natural goodness of it, must be reasonably well dunged, and withall so situated, as that the heat of the Sun may cherish it, and the nipping blasts of either the North wind or the East, may not annoy it: The choice thereof thus made; that the seeds may the better prosper, and come up after they be sown, you shall dig it two foot deep, breaking the clods as small as may be, and afterwards you shall divide the same into severall Beds of not above five foot in breadth, so that you shall not need to indanger the Plants by treading upon them, when either you water or weed them.

The Mulberry seeds you shall lay in water for the space of 22 hours, and after that you shall dry them again half dry, or some what more, that when you sow them they may not cleave together: Thus done, you must cast them upon the foresaid Beds, not altogether so thick as you use to do other garden Seed, and then cover them with some fine earth (past through a Sive) about half an inch thick. In dry weather you shall water them every two dayes at the farthest, as likewise the plants that shall come of them; and keep them as clean from weeds as possibly you can.

The time in which you ought to sow them for your best advantage, is either in *March*, *April*, or *May*, when frosts are either altogether past, or at the least not so sharp, or of so long continuance, as to indanger their upspring.

There is yet another way to sow them, and that is as followeth: you shall (being directed by a strait line) make certain furrows in the Beds above mentioned, of some four fingers deep, & about a foot in distance the one from the other: After this, you shall open the earth with your hands, on either side of the aforesaid furrows, some two fingers from the bottom, and where you have so opened it, shall you sow your seeds; and then cover them half a finger thick with the earth which before you opened.

When the Plants that are sprung up of the Seeds, are to be removed, and how they are to be planted the first time.

IN the moneths of *September*, *October*, *November*, *December*, *March*, or *April*, the next yeer after the Seeds are sown, you may remove their plants, (or in the moneth of *January*, if it be not in frosty weather) and set them in the like Beds as before, and about one foot the one from the other, but first you must cut off their roots about eight inches in length, and their tops about half a foot above their roots, more or lesse, according to the strength of the said plaints, for the weaker they be the lesse tops you shall leave them. In this sort you may suffer them to remain weeding and watering them (as need shall require) till they be grown six foot in length above their roots, whereunto when once they have attained, you may cut their tops, and suffer them to spread, alwayes having a care to take away the many branches or succours, that may any way hinder their growth untill they be come to their full length of six foot, as aforesaid.

When, and how the Plants are to be removed the second time, and in what manner they are to be planted where they shall remain.

IN the moneths aforesaid, (according as your plants are waxen strong) you may remove them either into the hedges of your fields, or into any other grounds. If in hedges, you must set them 16 foot the one from the other: if in other ground, intending to make a Wood of them 18 foot at the least

leaſt. But a moneth before you do remove them, you muſt make the holes (wherein you purpoſe to ſet them) about four foot in breadth, and ſo deep as that their roots may be well covered, and ſome half a foot of looſe earth left under them, having alwayes a ſpecial care ſo to place them, that they may receive the benefit of the Sun, and not to be ſhadowed or over-ſpread by any neighbouring trees.

When and how the Eggs of the Silk-wormes are to be hatched, and how to order the Wormes that ſhall come of them.

WHen the leavs of Mulberry-trees begin a little to bud forth, take the eggs of your Silk-worms, and lay them in a piece of Say, or ſuch like ſtuff, and in the day time carry them in ſome warm place about you, in a little ſafe box, but in the night either lay them in your bed or between two warm pillows, untill ſuch time as the Wormes begin to come forth: then take a piece of paper of the wideneſs of the ſaid box, and having cut it full of ſmall holes, lay it within the ſame upon the eggs, and upon that again ſome few Mulbery-leaves, to which the Wormes as they are hatched, will continually come. Theſe leaves with the Wormes upon them, you muſt ſtill remove into other boxes, laying freſh leaves as well on thoſe that are removed as on the paper where the eggs are; and this is the courſe which muſt be duly kept and obſerved, untill ſuch times as all the Wormes be come forth of their ſhels, ſtill keeping their boxes warm, as aforeſaid; but no longer about you, but untill the Wormes begin to come forth, out of which boxes you may ſafely take them, when once they have paſt their ſecond ſickneſſe, and feed them upon ſhelves of two foot in breadth, and 18 inches one above the other.

The ſaid ſhelves are not to be placed in any ground-room, nor yet next unto the tiles, but in ſome middle room of your houſe which openeth upon the North and South, that you may the more conveniently give them either heat or aire, according as the time and ſeaſon ſhall require. Beſides you muſt not make them cloſe unto the Wals, but ſo as you may

paſſe

paſſe about them the better to look unto the Wormes, and keep them from Rats and Mice, which otherwiſe might devoure them. You muſt obſerve the times of their comming forth, and keep every one, one or two dayes hatching by themſelves, that you may the better underſtand their ſeverall ſickneſſes or ſleepings, which are foure in the time of their feeding. The firſt commonly ſome twelve dayes after they are hatched, and from that time at the end of every eight dayes, according to the weather, and their good or ill uſage, during which time of every ſickneſſe, which laſteth two or three dayes, you muſt feed them but very little, as onely to relieve ſuch of them, as ſhall have paſt their ſickneſſe before the reſt, and thoſe that ſhall not fall into their ſickneſſe ſo ſoon.

The whole time that the Worms do feed, is about nine Weeks, whereof untill they come unto their firſt ſickneſſe, give them young Mulbery-leaves twice every day, but few at a time; from thence untill their ſecond ſickneſs, twice every day in greater quantity; and ſo from their ſecond to their third ſickneſſe, increaſing the quantity of the leaves, according as you perceive the Wormes to grow in ſtrength, and clear of ſickneſſe: from the third untill their fourth ſickneſſe, you may give them leaves thrice every day, and the fourth being paſt, you may let them have ſo many as they will eat, alwayes having a care that you give them none, but ſuch as are dry, and well aired upon a Table or cloth, before they be laid upon them, and withall gathered ſo neer as may be; at ſuch times as either the Sun or Winde hath cleared them of the dew that falleth upon them.

For the feeding of Worms you need obſerve no other order then this, lay the Mulberry-leaves upon them, and every two or three dayes remove them, and make clean their boxes, or ſhelves, unleſſe in times of their ſickneſſe, for then they are not to be touched; the leaves which you take from them when you give them freſh to feed upon, you muſt lay in ſome convenient place, and upon them a few new leaves, to which the Worms that lay hidden in the old, will come, and then you may paſſe them with the ſaid new leaves

to

to the reſt of the worms: And now leſt any thing ſhould be omitted, which ſerves to perfect the diſcovery of ſo excellent a benefit, I will adviſe you to be very diligent in keeping clean their Boxes, or ſhelves, as being a ſpeciall means whereby to preſerve them; wherefore when you intend to do it, you ſhall remove them together with the uppermoſt leaves whereon they lie, unto other boxes or ſhelves, for with your hands you may not touch them, till they have throughly undergone their third ſickneſſe, and then may you paſſe them gently with clean hands, without doing them any harm: provided that the party that commeth neer them ſmell not of Garlick, Onions, or the like. The firſt five weeks of their age you muſt be very carefull to keep them warm, and in time of rain or cold weather, to ſet in the room where they remain, a pan with coals, burning in it now and then ſome Juniper, Benjamin, and ſuch like, that yieldeth ſweet ſmels. But afterwards unleſſe in time of extraordinary cold, give them aire, and take heed of keeping them too hot, being alwayes mindfull to ſtore the room with herbs and flowers which are delightfull and pleaſing to the ſmell. As the wormes increaſe in bigneſs, you ſhall diſperſe them abroad upon more boards, or ſhelvs, and not ſuffer them to lie too thick together: and if you finde any of them broken, or of a yellow gliſtering colour inclining to ſickneſs, caſt them away, leſt they infect the reſt, and ſort ſuch as are not ſick, the greateſt and ſtrongeſt by themſelves, for ſo the leſſer will proſper the better.

When and how to make fit rooms for the worms to work their bottoms of ſilk in, and in what ſort the ſaid bottoms are to be uſed.

AS ſoon as by the clear amber-coloured bodies of your worms, you ſhall perceive them ready to give their ſilk, you muſt (with heath made very clean, or with the branches of Roſmary, the ſtalkes of Lavender, or ſuch lik) make Arches between the foreſaid ſhelves.

Vpon the branches and ſprigs whereof, the wormes will faſten themſelves, and make their bottoms, which in fourteen dayes after the worm beginneth to work them, you may

take away; and those which you are minded to use, for the best silk, you must either presently winde, or kill the worms which are within them, by laying the said bottoms two or three dayes in the Sun, or in some Oven after the bread baked therein is taken out, and the fiercenes of the heat is alaid. The other bottomes which you intend to keep for seed, you must lay in some convenient warme place, untill the worms come forth, which is commonly some sixteene or twenty dayes from the beginning of their work: and as they do come forth you must put them together upon some piece of old Say, Grogeran, the backside of old Velvet, or the like, made fast against some Wall, or Hangings in your house.

There they will ingender, and the Male having spent himselfe, falleth down, and in short time after dieth, as also doth the Female when she hath laid her egges, which egges, when you perceive them upon the Say or Grogran, &c. to be of a grayish colour, you may take them off gently with a knife, and having put them into a piece of Say or such like, keep them in a covered box amongst your woollen cloaths, or the like till the year following: But not in any moist room, for it is hurtfull for them, neither where there is too much heat, least the wormes should be hatched before you can have any food for them.

The making of a Wheel, as likewise the way to winde the said silk from the bottoms, can hardly be set down so plainly, as to be rightly understood: Wherefore when time shall serve, there shall be sent into every County of this Kingdom, a Wheel ready made, and a man that shall instruct all such as are desirous to learn the use thereof: Till when, I will commend these brief instructions to be carefully considered of all such as are willing to benefit either themselvs or their Country, that being skilfull in the Contemplation, they may the readier, and with less errour apply themselves to Action, which painfull industry, with Gods assistance, will quickly perfect.

An

An Extract of a Letter from Germany, *concerning Silk-worms, written to* S. H, *Esquire.*

AS for keeping of Silk-worms I must confess I have spent likewise some time in the ordering and observing of them inasmuch as this very yeare (1653) I have had from them so much good Silk (and equal to that which is brought either out of *Persia* or *Italy*) as have made mee two paire of Stockings. And I have found by experience that they may be kept as well in *Germany* as in other Countries, and that Mulberry-trees will grow in abundance upon our Lands; wherefore I have often wished that the Emperour (of *Germany*) would follow the most laudable example of the K. of *France*, who having forbidden the importation of foraigne Silk into his Kingdom hath thereby so much obliged the industry of the People of *France*, that they are come to a great perfection in this Silken Manufacture. But concerning the Experiments of making Silk out of Nettles or out of Flax, I never have tried either of them. Only I remember that I have seene once a very fine and delicate yarne or thred, which was made purely out of Nettels. I do not believe, that those Artist of *Hamburg* and *Wolfenbuttel* which you have named unto mee in your Letter, will communicat their Skil for a publique good, as long as they can get their own comfortable subsistance by it.

A Letter written by Mr. Ra. Austen, *from* Oxford, *Febr.* 18. 1654. *Imparting his Experiments about Silk-worms and how to wind off the Silk from the Bottoms, when the Worms have done spinning?*

COncerning my experiences about Silk-worms, I only say thus much. That I am fully satisfied upon good and sure grounds that the keeping of them (store of them) in these parts would be of very great profit, could we but get Mulbery leaves sufficient to feed them. For upon my own knowledge and experience (last yeare) upon some thousands of them, I see what might

might be by more. For my great doubt and question was satisfied about the winding of the Silke from the Bottoms, when the Worms have done spinning. I plainly see it is very easy, Children of 6. or 7. yeares old can apprehend it, and do it. For the Worms having done spinning, which is within 4. or 5. dayes of their beginning, through out-most silke is ravelled off, and the end is found immediately, which runnes on (5. or 10. or 16. or more bottoms together) in a bason of water, a little gum drag mixed. Some Bottoms (if the Worms were strong and well fed) run without breaking, scarce once or twice till all be off, and such as break, are quickly found again. The truth is, if the Worms are scanted of leaves, their silk is so small, that it holds not so well as that of lusty Worms. I saw many brave Skains of Silk wound off the last yeare, and help't to do part of it my self. Now the great matter is, How to propagate Mulberry-trees enough. As for the ordinary way, by boughes, we can have but few that way. I am from time to time experimenting other wayes by Seed, Inoculating, Grafting, &c: what will be the result, as yet I know not: I doubt not, but God will in his good time bring to light and set on foot many good and worthy designes, more then are in these Nations. We had need to labour to be of the like Principles of that worthy person, whose Paper you enclosed, patiently and humbly to waite the Lords season, and to designe for God in all we go about, which will crowne our endeavours with comfort and success.

A Rare and new-discovered speedy way, and easie meanes of keeping of Silk-worms, being thus made knowne to the Colony in VIRGINIA.

HEarken wel you beloved Planters, to what in these few lines I shall declare unto you; and is thus sent you in Print, that all of you may communicate the great and superlative good and benefit will be unto every one of you: *who so is wise, will ponder these things*, and give the praise and glory to God, the Author of all good Inventions; how Providence having

ving brought this to pass for all your exceeding great happines and increase of store of wealth, with so much ease, so little labour, no cost unto you; and in so short a time as fourty daies, this wealth flowes in upon you.

You now I conceive desire to know it, and I am as willing to impart it unto you: thus then in brief, in a plain manner, that all may understand it,

The same Lady, who last year sent you her Books of *Health and Wealth*, (who hath the happiness to beare the honourable name of your incomparable Countrey) continuing her sincere affections to the advancing of your welfares in all kindes; and amongst the rest in this rich work of Silk, knowing *Virginia* to be in all respects most proper for it, (as by a late Book sent you published by Mr. *Williams*,) not onely in regard of the Climate being the same with *China*, from whence the infinite quantity of silk comes, but abounding (as it doth) with Mulberry-trees naturally growing there, and exceeding it by the Silkworm-bottoms found in her Woods. She hath I say this Spring found out (by the speciall blessing of God upon her intentions) so rare, so speedy, and so costless a way and means for the feeding of Silkwormes; by the triall and experiment she so luckily made, to the admiration of all that have seen or heard of it, as a thing scarce credible; because not heretofore thought of, nay, as it were, held impossible by such Authours as have written of the ordering and feeding of Silkworms: that this her invention being thus made known unto you, her beloved friends in *Virginia*, she is most confident, and assures herself you will all there instantly without further delay (which will be the joy of her heart) become great and rich Masters of this noble Silk-work to all your unspeakable wealth.

The way to speedy wealth was by some hundreds of you to remove some 60 miles miles South by land, and to attempt the discovery of the Westerly Sea, on the border of Virginia, and both two very easily archieved, &c.

The lady hath of these Silkbottoms in her Cabinet as Jewels to convince the incredulous, they are ten times bigger then any in Europe to admiration, and of infinite incouragement to the work.

Do but as she hath done; follow but with good courage your cheerfull leader, and doubtless you shall finde (what she desires you may,) namely, *Great profit and pleasure* in an honest imployment. This Silken-Mine will be to you of more benefit then a Mine of silver.

In the beginning of *May* last 1652, when her young Mulberry-tree in her Garden began to put out its buds, then her

Contrary to Book Rule.

These eggs were purposely exposed to fire, cold, winds, and frost, being laid & spawned on a wall in a chamber, and there remained all winter long to try the vertue of the Eggs, &c. And twice before they came out of their bottoms, six times in all.

The seventh, they appear, when come out, a gallant silken white-winged Fly,

No weather it seems hurts them there; from heat and rains they shelter themselves under the great leaves as with a shield, but if either do harm them, how easie is a canvasse covering reared over the trees to save them from either of both.

Silkworm-eggs began to hatch, as the nature of this wise creature is, when her food begins once to appear, she comes forth of her shell: she presently laying a Mulberry-leafe upon these little crawling creatures, they came all upon it instantly; then she carried the leafe and them upon it to the tree, upon whose leaves they made haste to be; and there they day and night fed themselves, creeping from leafe to leafe, and branch to branch at their own liberties most pleasing to themselves; they grew and thrived wonderfully, and surpassed in largness of body those other wormes she kept in her chamber (she having been many a year a Mistris of Silkworms, and kept them by the Book-rules) this good and prosperous beginning heightened her hopes. The wormes, as their nature is, cast off or slipped out of their skins four severall times, still growing greater and greater to the singular delight and content of their Mistris. About 45 dayes thus feeding upon the leaves, they began that rare and glorious work of spinning their Silk-bottomes upon the leaves and branches of the tree; such a gallant sight to behold, it ravished the Spectators, and their Mistris joy was crowned with excess of happiness herein and hereby, apparently finding the incomparable felicity this would prove to her dearly beloved *Virginia*, (for so you must give her leave to call it,) for she concluded, and so must all you, that this being thus effected in *England*, how much more with assured confidence will the wormes live, feed, and spin in *Virginia*? she upon serious and due consideration of this thing, gave God hearty and humble thanks.

And what can any of you now wish, for more incouragement? the full proof is made, the work (or rather let me call it) the pleasure is effected with so much ease, so little cost, hazard or pains, as all may admire it.

'Tis not the hundreth part of your care, labour, or toyl you take about your Tobacco, and an hundred times (as I may say) all things put together more gain and profit to you then you make by Tobacco, which in truth is but smoak and vapour, but this a reall-royall-solid-rich-staple Commodity.

And yet if you will have still smoak, so this neither will nor can hinder your labour in that, or take from you any other employment you have a minde unto. Consider,

Conſider, conſider I pray you (beloved friends) your incomparable happineſs in this thing, and bleſs God for it. Surely I ſhould much wrong your judgements and patience if I ſhould ſpend any more arguments to perſwade you to this ſo great benefit to you, and ſhould be like to him that to manifeſt the clear Sun-ſhine at noon-day, brought in a candle.

In a word, there's nothing is or can be wanting but your true thankfulneſs to God for compleating this happy invention, and your preſent ſpeedy putting it in practice.

Yet give me leave, before I bid you adieu, to add the incomparable joy this Lady hath, who is confidently perſwaded (her daily prayers are to God for it) that this new invented way of thus keeping Silkworms on the Trees; it requiring neither skill nor pains, (this laſt being the only *Remora*, in the Savages nature, which withholds them from attempting any thing of labour) that when the Indians ſhall behold and ſee you begin the buſineſs, they will with all alacrity ſet upon it likewiſe, and imitate you. And that you to incourage them (as well you may) do agree with them, that for every pound-weight of Silk-bottoms they bring unto you, you give them (as well it deſerves) 5 *ſhil.* worth in any Commodities they deſire.

And thus by the bleſſing of Almighty God, there may be good hope of their civilizing and converſion; ſo that they may be likewiſe great gainers both in body and ſoul by this thing. And if this prove ſo, (Gods mercies and workes being far beyond our capacities) how much then indeed will *Virginia's* happineſs be every way raiſed to the height of Bliſſe. The promiſe being made, *That they that be wiſe ſhall ſhine as the brightneſs of the Firmament, and they that turn many to righteouſneſſe, as the ſtars for ever and ever*; which the God of wiſdome and power grant to you all in *Virginia*, and ſo, Lord, proſper this work in their hands, Lord, proſper their handy-work; good luck I wiſh you all in the name of the Lord, *Amen, Amen, Amen.*

Memorandum, that you take notice, that the Birds will eat up the Silkworms on the trees, ſo that care muſt be had (and it's eaſily prevented by ſeverall wayes and means, as you will de-

devise) to scare away the birds; if all fail, a boy may be set that may affright them them al away with some noise, or by nets encompassing the trees, and the birds will also carry the Silk-bottoms off the trees, if they be let there remain; but thats soon prevented, by taking them speedily away. And this of the birds is the chief reason, that *Virginia* abounds not with plenty of the naturall wilde Silkworms, they devouring most of them: and it's a wonder how any at all escape them, but that God preserves some few of the race, that his power and wisdome may be seen, and the aptnesse of the Countrey to invite you to the work.

For their Bottom being ten times bigger then ours, what mighty great Worms must they be, and what incouragement is this to the businesse, and how much more silk they make then ours, &c.

It will be good for you to incourage the Savages, when they finde any bottoms in the woods, to bring them to you, that you may get of the race, and seed to increase it. Some say, the originall Silkworm is produced by the corruption of the old Mulberry-tree and leaves, by the Sunne and moisture. But that none of you may want a stock to begin your Silk-work, the Lady aforesaid hath sent you store of Silkworm-eggs to be distributed amongst you: and if you begin but with an 100 eggs this year, they will next year be above 1000; for one female Silk-fly will lay 3, 4, 500 at a time, all things more and more concurring to your incouragement.

Till you can get and gain the Egg and Seed of your naturall gallant large Silk worm: which is chiefly that you must endevour to store your selves with, no Eggs comparable to it, &c.

Now the two Propositions that tend to infinite welfare, benefit, and wonderfull advantage both to *England* and the Colony joyntly, are those that follow, they which upon no terms are to be omitted to be published and effected.

First, that with all speed some kinde of Coyne be sent to *Virginia*, that may be authorized to passe there for their Commerce and better trading. But whether all silver somewhat valued above its worth, or part silver and part copper, is left to the wise judgments in that case. But of this confidently be assured, that without some kinde of coyn or other, that Colony can no way prosper or thrive, nor any staple-commodities be set up, or Artificers in any kinde follow their professions: for Tobacco being now their money, and that with which all Commerce is driven, and paiments made in, and passeth from man to man; all men are set upon that thing with the neglect of all other rich and solid innumerable Commodities that are

in

in that land to be had: and till this remedy of Coyne be applied, there can be no prosperity in that Colony. Were not the thing as apparent to all mens understandings as light is from darkneſſe; I ſhould alledge many reaſons for it, but it's ſo needleſſe to ſpend time about it, as it might well be thought a great abſurdity. What then remains? but that ſome publique ſpirited Patriot that would immortalize his name and honour in the procuring of this ſo neceſſary a thing to be ſpeedily effected, wherein alſo as the generall good he ſhall do, ſo the benefit will be ever great to thoſe that ſhall undertake the carrying over this Coyne; be it what it will be, all men know it ſo well what the gain will be, as there's no need to name it in particular manner, they cannot wiſh for more profit then that will be to the undertakers, and the Colony will with all their hearts be content with it, and eſteeme them happy and thrice happy Benefactours.

The ſecond thing is, that a Publication be procured and ſent to the Colony in *Virginia*, declaring unto them, that there ſhall be liberty for all men to bring from thence for the ſpace of ten years to come, any commodity that they ſhall there raiſe, into *England*, Cuſtome and Excize free, (Tobacco onely excepted, which may pay double Cuſtome, if ſo thought fit:) and further that to what value of money ſuch commodities ſhall be ſold for here in *England*, (being rated at the Cuſtome-houſe at their entry;) it ſhall be lawfull to carry out to *Virginia* any Commodities again to the ſame proportion & worth, Cuſtome and Excize free.

Theſe two reaſonable things granted; as they ſhall infinitily with all ſpeed advance the Plantation, ſo ſhall they (all things duly weighed in the ſcale of prudence) be no leſſe beneficiall to *England*, as all men that have their eyes in their heads, and Engliſh hearts in their bodies, ſee and apparantly know, nothing more ſure and certain; and all ſtable and needfull Commodities brought out of all-liberall-*Virginia* into *England* at a very reaſonable rate and price, much cheaper then now we have them, and are fain to fetch them with great hazard from doubtfull friends, or Heathen Nations, to their great enriching and our own impoveriſhing, as to all knowing men is

moſt apparent; we ſhall be free from the uſurpation of forreign Princes and States in our Eſtates, Lives, Liberties and ſhipping: and we may conclude boldly and rejoycingly, that Providence hath provided this all-ſufficient Countrey of *Virginia* againſt theſe times, and to theſe intents, that hence we may have all we want from our own brethren, our Navy there increaſed to what number we pleaſe; for this incomparable land affords naturally all whate're belongs to the building and rigging of a Navy in all compleat manner from top to toe, as may be ſaid; and by a ſafe, a ſure, certain, eaſie, near at hand weſterly diſcovery, (part by land, and part by Rivers and Seas) contract all the riches of the South-ſea, the *Molocos*, *Philipines*, *China*, *&c.* by 3000 leagues neerer to us, without moleſtation by any Prince or Pirat, and ſhall not need at all to be troubled, if *Ruſſhia*, *Poland*, *Denmark*, *Sweden*, *Norway*, *Germany*, yea *France*, *Spain*, *Italy*, *Conſtantinople* were removed 5000 times more diſtant from us: for in one word, what ever theſe Countreys afford, either neceſſary or ſuperfluous, all-ſufficient *Virginia* within its limits will produce unto us. And ſhall there not I ſay then now be found a zealous Patriot, that will ſtand up for his Countrey, and procure theſe things to be done out of hand? Now God forbid; I commit the buſineſſe to God, having done what I conceive my part is, who onely have good wiſhes, and daily prayers to attend this enterprize, which God proſper, *Amen.*

Sir Francis Drake was An. 1577 in a Weſterly Sea one the back of Virginia, in 37 degrees in oppoſite to the head of James Town in Virginia and he ſailed from that Countrey which he called Nova Albion, in an open Sea to the Molocos and China, and ſo that alſo this way a trade may be made to thoſe places to the back of Virginia, &c.

POSTSCRIPT.

At a friends importunity, (the former part ſent to the Preſſe) I am thus enforced to make this Addition, and upon the great hopes that upon triall it will be found, that you may have two Silk-harveſts in one ſix moneths time; of the eggs a ſecond brood may be hatched in *June*, and ſo fed by Mulberry-leaves, though then it may be it muſt be in an houſe, that then for the promoting of ſuch a good deſigne nothing of incouragement may be wanting, nor any obſtructions in the buſineſſe, under pretence of wanting needfull houſing for to feed the wormes in. Thus much I will aſſure you,

That

That the slightest and simplest kinde of housing or coverture (though the books are too superstitious and ceremonious in the rules which are many that they give concerning the ordering of the worm, which are not so necessary as they pretend;) I assure you, you will abundantly content and satisfie this, though noble, yet most humble creature, even with any habitation to do her work in. And to this intent I now declare unto you, (that all excuse may be taken from you) that the poor simple people in *Italy*, *Spain*, *Languedock*, *Provence*, *&c.* do keep and feed their Silk-worms in the same low earthen-floored Rooms, wherein themselves lodge and do all their houshould-affairs, feeding them on shelves and on tables, giving them leaves without any more curiosity; and they thrive and prosper with them as well as in the greatest Cities and stately chambers of the greatest rich mens Palaces.

Sicily.

And that in *Sicilie* and *Calabria*, the common Silk-Masters there do at time of year in the Spring, set up only slight boarded houses in the fields round about the Mulberry groves, and placing shelves in the inside of them, two foot one above the other to the roof, and a table all along the mid of the room; they strowing their leaves on these shelves and table, there feed their wormes, and there they spin in the room their Master lies for the space of five or six weeks time, and they have abundance of silk without more ado, and a man and a boy will tend all the worms that come of six ounces of eggs, and those wormes will spin 60 pound-weight of silk, and that but at 20 *shil.* the pound, is worth 60 *ls.* in ready money, a sufficient gain to allure a man to the work I trow; but the gain by the naturall wormes multiplying will farre exceed it. And I may not forget yet more that the Persian manner is to pitch up onely tents of *Canvas*, and Booths round their Mulberry-woods, and there-under they strow the Mulberry-tree-leaves on the ground: there their wormes feed and live and spin, and do well in all kindes, the *Persians* living also the time of five weeks in the tents. Thus all these examples do manifestly prove unto you, that very simple and slight housing and a little coverture will content the Silk-worms, and they will thrive well in them. And thus you see that very poor and slight houses in *Virginia*

The great gain of the Silk-works in a house, how much more in the trees, will it be to you.

The simplest and slightest houses or coverures will be sufficient for the Worms to feed in, and live and spin, let no man doubt it, &c.

will do the deed. Nay rest assured that the very Savages houses built but with Poles Arbor-wise, and covered top and sides with mats, will be abundantly satisfactory to the wormes, and they will thrive in them as you shall finde upon triall. And let me tell you, being desirous that you may do all things with the least cost and labour to you, and to invite also the Savages to the work for their own gain; do but take your Reeds and small Canes in *Virginia*, and run but a strong needle and threed thorow the Reeds which will hold them together, and so you may presently make shelves and tables with them as narrow and as broad as you please; and in truth you shall finde this kinde of shelf and tabling to feed your worms on much better in many respects then boards: but you may make triall of the Persian way also by strowing your leaves on the ground in these houses, and so feed them, and so your second brood of Silk-worms may also be thus kept and nourished in this kinde of housing and coverture; Experience is the Mistris of fools, saith the Proverb: and it is not an unwise mans part often to make trials, though to some men they may seem impossibilities, yet rare and strange things have upon triall often been found out; and if you would but shew the Savages samples of all kinde of things, you should soon by them know more in a moneth what is in that Countrey to be had, then you have done these 40 years; and for reward they would bring in of all kindes unto you, what they have and you desire to know, so a sudden discovery may be made of all things in that land to your infinite gain.

Concerning the winding off your Silk, this Lady hath sent you one of the wheels, so that by it all of you may make the like to do that work, so you shall want nothing to speed the work

To conclude with this *Memento*, that there are nine things that appear, are of no or small difficulty to you and the Savages to enterprize, and get gain and wealth to be produced from these Commodities; I will but name them and leave them to your better judgements and thoughts.

1 This Silke, so easie, speedy, and profitable a thing.

2 The Silk-grasse naturally there growing, which to the *Indians* the onely labour is of putting it up, and bringing it to you at such a price; a rich Commodity if known.

3 The planting Vines, small labour, little cost, long enduring.

4 The multiplying of Cunny-warrens, ſo eaſie a thing, the wool of a skin now worth 8 pence, which is more then the body, yet the fleſh is conſiderable meat; the wooll is and will be very vendible for this new Invention, not onely of theſe fine light hats now ſold at 15 and 20 *ſhil.* but the ſpining of the wool, and making ſtockings of it as fine as thoſe of ſilke.

5 The increaſing of abundance of Bees for wax and honey, their food ſo plentifull in *Virginia*, as in no Land more, and if with an hatchet you do but ſlaſh your Pine-trees, Firre-trees, Locus, and other trees, there will ſtore of liquor come out of them, on which the Bee will gather infinite ſtore of honey and wax, as in *Ruſſia* and other Countreys they do.

6 The planting of Sugar-canes, that being no more laborious then the Indian wheat, ſetting it, and once ſet in good Land they grow eight or ten years, and the Indians pains will onely be to cut them yearly down, and ſell them to you.

7 That of the Cotton-tree is the like for many years, gathering of the cods of woll from them, as we do Roſes from the Roſe-buſhes.

8 That of Ginger ſoon done, the planting and the gathering of it.

9 That of grafting your Crab-trees with Apples and Pears for Sider and Perry, you knowing that a man in one day will graft an 100 ſtocks, and they will grow night and day, while you eat, ſleep, and play, and laſt 100 years to your great gain and profit.

I may not further inlarge my ſelf for the preſent, theſe are but taſtes and hints for your better wits to worke on: ſo with a thouſand good wiſhes, I bid you adiew.

Floreat VIRGINIA.

The fashion of the Botome.

The Silke Bottome of the naturall Worm in *Virginia*, found there in the Woods, is ten Inches about, and six Inches in length to admiration: & whereas ours in *Europe* have their Sleave and loose Silke on the outside; and then in a more closer covering they intombe themselves. These rare Worms, before they incloſe themselves up, fill with Silke the great emptinesse, and afterwards incloſe themselves in the middle of it, so they have a double Bottom.

The looſe Sleave Silk is all on the outside of this compaſs, for if that were reckoned in, the compaſſe of the Bottom would far exceed this proportion: But this is ſufficient to be the Wonder of the whole World: to the Glory of the Creatour, and Exaltation of *VIRGINIA*.

A Loving Advertiſement to all the Ingenious Gentlemen-Planters in Virginia *now upon the Deſigne of* Silk. By V. F.

Gentlemen,

SVch hath bin the ſingular favour of Providence to you and the Lady, that ſince the publiſhing of this Book; it hath ſo happily lighted into the hands of divers worthy perſons, being not only Gentlemen-Travellers of credit, & Merchants of reputation; but likewiſe wonderfully taken with the love of *Virginia*, and no leſs zealouſly affected to the advancement of the Silk-trade in that Land, which they judge (not of their experience and knowledge of what they have and obſerved in the Eaſterly parts of the World, where abundance of Silk is made) that no part of the World is more proper for Silk then Al-ſufficient-*Virginia*: In regard of the excellency of the temper of the Climate, which naturally produceth not onely Mulberries for food, but the Silk-worme it ſelfe, in that wonderful greatneſs of the wilde Silk-bottom: which as they ſay, The whole Vniverſe affords not, nor brings forth the like to their own ſmall admiration. And that there is no greater quantities of them found or ſeen they conclude, it is in regard of the birds who are their natural enemies, & devoure moſt of them. And theſe Gentlemen are confident, that you did not know & practiſe thoſe ways and meanes, for the feeding and preſervation of them, as in ſome far remote Regions is practiſed by thoſe Nations, that are expert Maſters of Silk-wormes, *Virginia* would inſtantly abound with great ſtore of Silk, and ſurpaſs all thoſe Countreyes in that rich commodity, and you all become with great ſpeed and ſmall coſt, or little labour one of the happieſt, wealthieſt people that the World affords. And to the intent that ſuch a bleſſing may not be longer wanting to you, they have out of their ſuperlative benigne affections, and publike ſpirit, imparted to the Lady theſe enſuing Relations, with their earneſt deſires and adviſes, that you all in *Virginia* may out of hand be made partakers of them. And then knowing them, you may no longer live in groſs darknes and ignorance of ſo great a treaſure that you are poſſeſſors

of

of, and may now have and enjoy the full use and benefit of, which hitherto hath most strangely been hidden from the eyes of body and mind; They conceiving that the chief cause thereof hath been the pernicious blinding smoak of Tobacco, that thus hath dimmed and obscured your better intellectuals; but when you begin to put these wayes & means in practice, they say you will blesse your selves (as they do) that you have not in this long time discovered the infinite wealth and happiness that will arise unto you out of Silk. But not longer to detain from you this most precious eye-salve, for the speedy curing of your infirmity, and making you all rich (which is your main aime in that new world).

Hearken well to these Informations, which the Lady earnestly desires may thus be with all speed made known to you all.

THe one Traveller declared, That he passed a Countrey where he saw those people had their Silk-worms feeding on their Mulberry-trees in the fields & there they live & spun their Bottoms on the trees, And to protect this noble profitable creature & to defend it from the birds, they used a most slight, simple, plain invention speedily effected & of no cost or labour to them, which was certain great sheets of Reeds or Canes, that they hung over and about their trees, tied to certain poles that incompassed them. And in this easie manner they obtained great abundant quantities of silk, to their wonderful inriching. The sheets of Reeds were joyned together by a needle and thred, running through each Reed at several equal distances, and so drew them close and firm together. This for you to imitate, is in every respect to your wonderfull happiness.

Another of these Travellers saith, That he passed a Countrey where the inhabitants did make large Tents or Boothes all of Reeds and Canes, and in them placed shelves and tables made likewise of Reeds, on which they fed their Worms, strewing leaves on them. These tents they set up round about their Mulberry-Groves, and with much celerity, and no cost.

A third Gentleman and Merchant, that lived long in the

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fartheſt parts of *Turkey*, affirmeth, That there the inhabitants begin every Spring, *March*, to feed their Worms, and continue it till *October*, ſix moneths time: their Worms hatching & re-hatching, one generation or brood ſucceeding the other: ſo that they have three harveſts of ſilk-bottoms, in that ſpace of time, every five or ſix weeks one: they feed their Worms in great long Barns made of Reeds or Canes, the walls and roofs of them, and ſhelves as aforeſaid, and the Wormes when they have done feeding, ſpin their bottoms upon the reedy walls and roofs; and that they have two crops of leaves from their trees: for thoſe trees that have their leaves pull'd off in *March*, *April*, and *May*, do re-leave again, and have new and freſh leaves in *June*, *July* and *Auguſt*, wherewith they feed their latter generation or brood of Wormes very profitably.

And in confirmation of this, you ſhall know, the ſame hath been found true in *England*, that the Mulberry-tree will leave twice in a Summer, the Lady had the experience of it, and therefore much more will it do with you, which will be a moſt ſingular advantage to you.

I muſt not omit to add what theſe Gentlemen farther adviſe, that you can never ſufficiently augment the ſtore of food for this Noble Creature: for ſtore of food is the main foundation, upon whoſe ſpeeding the Silk-trade is to be erected: for if that be not wanting, no obſtruction can be in it. For the glorious Worm is ſo infinite in multiplication, with that celerity as is incredible, ſo that ſhe will never be defective unto you: they therefore counſell, that you graft your Mulberries with all care and ſpeed upon theſe ſeverall trees, upon which they will exceedingly thrive, *viz.* the *Popler*, the *Elme*, the *Cheſnut*, *Beech*, *Quince*, *Medler*, *Fig*, *Peare*, *Apple*, and *Cornell*-trees. And alſo upon any other trees, of which upon a trial you find the Worm will taſte or eat their leaves. Likewiſe that you ſet of your Mulberry-ſlips as big as your thumb, about two foot long: and put them into good wel-digg'd ground in *September*, ſetting them a foot in the ground, bruiſing the ends of them, and watering them the next Summer well, if need be: in the ſame manner as in *Kent*, they ſet the

Codling-slips. That you also cause the *Indians* to bring unto your habitations all the young Mulberry- trees that are within an hundred miles of your Colony. But let me acquaint you that they admire what some Gentlemen Planters of credit tell them; that your brave Wormes do not only live, feed, and spin upon the Mulberry-trees in the Woods, but do the same upon the *Poplar*-trees, *Plum*-trees, and *Apple*-trees:: such an incouragement to the *Silk-trade*, the World (say they) never yet heard of before, which must needs lift you up to a most speedy and incomparable height of wealth and riches, in a moment of time.

And by your gentle patience and generosity, give me leave to propound unto you, the earnest request the Lady hath to all of you; that you please to inform her (being also the desire of many others) how it comes to pass that your Wormes get to your severall trees, not only to the *Mulberry*, but to others: For in no other Countreys the *Silk-worme*-flie doth use her wings to flie with: so that yours must either do it (and so at time of yeer couple and flie to sundry trees; and there lay their eggs which remain till Spring again) or that your trees do naturally ingender and produce the Wormes (as it is conceived, the original of them so hapned at first) but which way soever it be, it's rare and remarkable; and proves *Virginia* to be one of the most superlative Countreys in all the Vniverse for the *Silk-trade*; and none comparable unto the excellency of its naturall temper for *Silk*.

Then that you also inform her all you can of the nature, actions, qualities and dispositions in all kindes of this most wonderfull Creature, every way so admirable, what by any *English* or *Savage* hath bin any way observed in her: when her eggs first hatch, then how long time she is feeding before she spins, upon what part of the trees she fastens her Bottom; How long she continues in her Bottom before she comes out a Fly, then when they couple, where they lay their eggs, upon what part of the trees? How long they live after that time? For these in the old World never eat after they once begin to spin: how large in bigness and compass are commonly their bottoms? if all of one colour, or divers? In what part

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of the Countrey are moſt of them ſeen and found? what do the *Savages* call them, or know any uſe of them; what birds are they that moſt devoure them? (for did they not, they would ſwarm all the Land over in a very few yeers); if any thing beſides birds be hurtfull to them? Their greatneſs and doubleneſs of their Bottoms are wonderful, none ever known to be ſo, which argues the ſtrength and richneſs of this noble Worm, her vigour and hardnes exceeds, that can endure all wethers and ſeaſons both alive and in her eggs. A great incouragement to you all that ſhe is not a nice curious kinde of *Silkworme*; but ſtout and robuſtous, that will require little care or attendance, of ſmall coſt unto you. But her food and protection is all ſhe requires, and pays you ten thouſand-fold for what you beſtow on her. That you pleaſe to ſend of her Bottoms to ſatisfie all men, who are like the Queen of *Sheba*, much better truſt their eyes than eares; ſome of their eggs likewiſe upon that which they lay them, and the Fly (though dead) which will many a yeer retain her perfect form in a box: do not the wormes hatch and ſpin twice or thrice in a Summer?

Let me add one Petition more, and I have done. *viz.* That ſome of your precious Silk-graſs may be ſent the Lady, who is confident upon the triall ſhe will make of it, ſhe will give you ſo pleaſing an account and ſo profitable unto you, in making known unto you what an unknown wealth you have: ſhe prays you (and all is for your own gain) to bore and cut all your trees (a moſt eaſie thing) and thereby you ſhall diſcover preſently, what rich Gums, what Balſoms, what Oils, and precious healthful Liquours they will yield you for profit & neceſſity: For all men know that many kindes of trees do yield moſt pleaſant and healthſome Wines (as I may call them) for man to drink; ſo alſo you will finde out all ſorts of Dies and Colours (inſtantly done): cut and bruiſe all kindes of your Woods, Barks, and Leaves of Trees, Roots, Berries, Nuts, Fruits, Plants, Weeds; and but boil them in a Skillet, and then put in a little piece of white Woollen or Linnen cloth with ſome Allom, and you ſhall inſtantly finde and ſee what rich Colours they will make. What is *Indico* but a Weed, ſo

Woad and *Madder*? What is *Brasil*, *Fustick*, *Logwood*, and many more kinde of Dies, but Woods? what Coucheneal the rich Scarlet die, but a Fly, or the excrements of the *Indian* Fig-tree? what is the new-found rich dying stuff of 25. *l.* a Tun, but of a tree that is brought from the Island of *Liberty*, neer Cape *Florida* where Captain *Sailes* plants? And shall *Virginia* not yield a drop of good Liquour or Colour? It cannot be; if but a triall thus easie were made.

By burning of all kinde of Woods and Gums, you'le soon finde by your nose what sweet Perfumes they yield. And by the ponderousnes or weight of earths, you may know if Minerals or not? Let it be known also, if you have not Waters of more than ordinary qualities; for taste, colours, smell, weight, hotnes, or coldnes? there is much depends upon them. And you shall know if they proceed out of any Minerals, by taking a glass full, and putting into it a Gall beaten to powder, which will turn the water into a reddish colour: and send samples of all kinde of strange earths, and of all other kinde of things without fail. And lastly, (if it be not too much presumption to beg the favour to receive that honour from you) which she no wayes deserves nor can hope to requite: To inform her what be the things, the wayes, the means to advance *Virginia's Prosperity*, if they may be procured and effected. If any errour be committed in telling you all this: there is hope your pardon may be obtained, seeing your onely good and benefit hath caused all this that hath been said: and the zeal of your wealth and happines hath drawn all to this length:

Sirs, you have the faithful testimonies of those aforesaid worthy Gentlemen, and nothing can be now wanting unto you but putting all in practice, what they have declared; and for your good are such invitations and incouragements unto you, that more cannot be wished for. There remains nothing but humble thanks to God, and to these Gentlemen your due respects, whom God hath made such Instruments for your happines, hoping their noble courteous examples will allure all other Gentlemen Travellers to cast into this good work some mites of their further knowledges, and every man

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to contribute his prayers and help to this or any other hopefull desigine: seeing the consequence of them may be so good and great, not only to the *English* Nation at home and abroad; but to the poor *Savages* their welfare of souls and bodies, which God grant.

An Other Advertisement.

THe Silk-Trade, (unlesse we will be deaf to Reason and Experience) cannot be denyed the precedency of all Trades that are at this day a foot, in either World: And that in regard of its great and certain gain in so small a time; A man and a Boy being able to tend as many Silk-worms in two Moneths space, as will yeeld you sixty pounds: * which done, they leave you ten Moneths free for any other imployment. In regard of its small skill, lesse pains, care and labour, no hazard, no cost or charge, (more then a twelve-penny Reel) no troublesome tools or Implements: in regard of its incredible ease and pleasure, as not requiring strength of Body, of Wit, of Purse, any stock to begin with, only hands and eyes to gather leaves and feed the Worms with, or protect them from the Birds: if kept on the Trees (their natural Mansion:) Admitting of all Ages, (for a Child can do all that belongs to it) all Sexes, all Qualities, (a most fit recreation for Ladies, especially being begun and ended in the two pleasantest Moneths of the year, *March* and *April*.) And all Callings too; for if Saint *Paul* made Tents, who can plead exemption from tending Silk-worms? * Again, Silk is lesse chargeable in Ware-House, Fraight, &c. then any other Commodity, and yet none more durable, lasting, neat, vendible, nor more easily transportable: for Five hundred pounds worth of Silk, fraights lesse, and takes up lesse room then ten pounds worth of Tobacco.

According to that is made in Sicille *by a Man and Boy.*

A most proper imployment for the lasie Indians.

Now where Worms and Food abound naturally, and the Inhabitants are born with Brains, the advancement of the Silk Trade must needs be proportionable: upon which double score *Virginia* hath the advantage of any place in the yet discovered World; I mean for Worms and Food, which may be thus severally demonstrated. Their Worms (partly annually

produced by heat and moysture as our Caterpillars and other Insects each Spring, partly by Eggs which have escaped the Birds who are the greatest cause of their scarsity (which otherwise would swarm over all the Land) devouring them when they are Worms, Eggs and Bottoms) exceed ours not only in strength, hardinesse and greatnesse, (being when Flyes as big as mens Thumbs) but also in the largenesse of their Bottoms, which are as big as Limons; (for Mr. *William Wright* of *Nansamond* found of them above seven inches round) and one of them weighs more then a score of ours; insomuch that whereas a Thousand of our Worms made but one pound of Silk, worth at most here 30s. a pound, a thousand of their natural Worms will make ten pounds of Silk, worth here twenty shillings the pound. And certainly they need not object or be troubled at the somewhat more coursnesse of their Silk, since they from the same number of Worms receive ten pounds in mony for our thirty shillings.

As for their Food, the *Virginia* Worms feed not only on the Mulberry (their sole food in all other parts of the World) but also on the Crab, Plum, Poplar; Oake, Apple, Cherry and Pohickerry-tree leaves, with sundry other shrubs and bushes. For proof whereof, Mistresse *Mary Ward* sent over to her Couzen ten bottoms taken from Apple trees. Esquire *Ferrar* her Kinsman likewise sent her ten more, pulled off from Oaks and divers shrubs. Mr *Laurence Ward* some taken from the Pohickerry tree, Mr *Wright* from the Cherry tree. So Mr *Russel* and others.

The Objection, or rather groundlesse surmise of the Worms being hurt by Thunder in *Virginia*, is sufficiently cleared, not only by the Natural Worms living so well, and thriving there so admirably on the trees; but also by trial made there this Spring of our Worms. That ever to be honoured Noble Squire *Diggs* having (at his very great charge) sent for two *Armenians* out of *Turky* skilful men, and made ten pound of Silk, which had not want of Eggs hindred him, would have been so many Thousand pounds.

Nothing then wants to make *Virginia* rival *Peru* for wealth, more then to perswade the Planters to provide themselves this Winter

Winter (to loſe no more time) of as many of the Natural Worms bottoms as poſſibly they can. They will now be found in the Woods on the diſ-leaved trees, though moſt of them are ſpun by the Worms on the tree leaves, which falling to the ground, they periſh with them; and this is another great cauſe that ſo few bottoms are to be found. The Bottoms thus gotten muſt be carefully kept in ſome long boxes till the Flyes come forth, happily in February or March. For they remain in their bottoms 300. dayes, ours but 20. ſo that their Eggs (whereof one female will lay a ſpoonfull, ſuppoſe 500.) lye unhatched but about nine dayes, ours nine moneths.

When your Worms are hatched, you may keep them either on the trees (being aſſured that they will live on that kind of Tree whatſoever it be from whence you took your Bottoms) and then you ſhall need onely to protect them from the Birds; or elſe in ſome ſlight kind of houſing, Reedy arbors, Indian manſions, or what elſe you can deviſe there cheapeſt and ſpeedieſt, and then your onely labour and care is to give them leaves, which you may either ſtrip off, or clip from off your Trees, or if you will, lop off little branches (which may perhaps prove a good way for you: for thereby the leaves will remain the longer freſh) and give them to your Worms, who for the labour of every Man and Boy thus inployed only in two moneths time, will repay you with threeſcore pounds worth of Silk.

Your own Experience (Gentlemen) will I hope ere this time twelv-moneth certifie you of the truth that is here ſet down, unleſſe you ſhall rather chuſe to hugg your own poverty, and make much of that ſlavery and drudgery you wear out your ſelves with, in toyling about that contemptible, beggarly *Indian* Weed,

TOBACCO.

The Copy of Esquire *Diggs* his Letter, to his much honoured freind, *John Ferrar*, Esquire at his house at little Gidding, in Huntingtonshire. From *Virginia*, June 21. 1654.

Sir,

I Have received your many and severall Letters, printed papers, and Quæries; and, would my occasions have permitted, I should ere this, have given you that due thanks you deserve, and punctually have answered all your judicious and pleasing Quæries: But I was so taken up in sending dayly for Mulberry-leaves, as they are now so far scattered from my present Plantation, that I could not possibly answer your expectations; That onely difficulty made me to make but 400. *pound weight of Silk-bottomes, which I caused to be wound of* 7. *or* 8. *l. of Silke in a day: Sir, I doe very well approve of your last well printed Paper, sent the Colony for making triall of the Naturall Silk-worme, but such was my ill happe, that I could not this spring meet with any of those Bottoms, but shall this next Winter procure of them, all I can; Sir, I am now confident, I have conquered all the great feared difficulty of this rich commodity, and made its sweet easy and speedy Profitt so evident to all the Virginians (and that it doth not at all hinder their too much beloved* Tobacco, *but that they may proceed with both together) that now I doubt not (nor they) but that in a short time here will be great quantities made of Silke; you in* England *will reape much advantage, and gaine many waies by it, (more then most men can pet see) and I by Gods blessing the comfort and joy, in setting up so noble, so beneficiall, a staple vendible commodity. My people differ very little from the rules set down in your, Mr.* Williams *his Booke, and as Esquire* Samuell Hartlib *hath also directed in his advertizement of Silk-worms unto us; only in the hatching of the Worms-Eggs, they are more curious, of which I shall, when I have more time, give you a more particular accompt: I made* 10. l. *of seed or Eggs this spring to give away to diverse Planters, that are very earnest (seeing so great a benefit before their eyes) to become also Silk-masters, you need not feare it but that this next spring there will be divers tryalls made of the hopefull Naturall Worms, that you so highly prize (and not without good cause) and which is more, perhaps they may fall one after another*

ther and be re-hatched that we may have a double Silk harveſt in one ſummer (as you have formerly hinted to us). Pray Sir will you be pleaſed at this time to excuſe my too much brevity in this great buſineſs of ſo much concernment, of ſo much happineſs to this Country, and attribute it to my great haſt, and much buſineſs upon the ſhips ſudden departure, having many more diſpatches to make to Freinds; But in my next, I ſhall make you double amends; I pray preſent my ſervice to the vertuous Lady Virginia: *Sir I daily pray for your long life, and well-fare, and now reſt.*

Sir your moſt humble Servant,
Edward Diggs.

A Way Experimented by Mr. Farrar, *to make the Gummy-hard Naturall* Virginia *Bottoms (which hetherto by no art could be be prepared t o unwind by reaſon of the Gummy hardneſs) to unwinde with eaſe, to the great advantage of the Planters of the Silk-trade in* Virginia.

YOu muſt take Sope-boylers lye or liquor, which is very ſharp and ſtrong, and ſet that in a veſſel over the fire till it be warme, then put in as many of your hard gummy Bottoms as you pleaſe, and let them reſt in that liquor, till it be ſcalding-hot, and ſo remain half a quarter of an houre more or leſs, till they be ſo diſſolved, that you may take out one and find it fit to unwind; which you muſt thus doe.

Firſt put the Bottoms into ſcalding clean water, and having layen a while therein, then take them out and proceed to unwind them as the cuſtome is.

In caſe Sope-boylers lye or liquor be not to be had, you may make a ſtrong liquor of the Aſhes of any Wood, with boyling water, the ſtronger the better, and this may and will alſo perform the work. And this is juſt as you make a lye to buck clothes withal. Only note it muſt be very ſtrong made.

An Extract out of a very Ingenious Gentlemans Letter from Dublin, *Concerning the Reformed* Virginian *Silk-worm.*

I Thank you for your *Virginian* Paper. Me thinkes the Experiment is most Natural to my apprehensions, that the Worms should feed and thrive best upon the leaves growing on the Trees, rather then in the Houses, and that they, like other Caterpillers (of whom these are a sort) did at first breed so, and that Houses were rather an Invention for expediency,

But their Proposition about Money to be carried to *Virginia*, I utterly dislike; even somuch as if it were possible, I would banish Money from *Ireland*.

An Animadversion upon the Letter from Dublin.

I like not the Gentlemans Reason why he likes the Proposition concerning feeding of Silk-worms upon the Trees.

For almost all Plants, even the most rare now in use were Originally (namely since the deluge) wild and past muster amongst Weeds, & are improved to such a degree of excellency to the eye, nose or palat, by industry and home-helps and contrivances: So *John Tradeskin* by *Lambeth*, by the advantage of putting his Trees, and other Plants into a warm house in winter or a stow, nurses up those things faire and fragrant, which would without that help either dye or be dwarft. This is the reason why tame Pigeons or Conies are larger, and breed better, and oftner then wild. Yet I conclude not against the thing it self; for questionles, that the leaves have more heart, fresh and greene, then halfe withered, if the cause of their withering were known or considered, But I can say little to this, as having no experience,

A new observation, concerning the feeding of Silk-worms with Lettice, imparted from Dublin.

I Have only to present you with some observations I made concerning the feeding of Silk-worms (meeting here accidentall

cidentally with a kinſwoman of mine that keepes great ſtore of them) which generally is beleeved only to be don, with *Mulberry* leaves: the contrary of which is here by ſome practiſed. *viz.* to feede them with Lettice; which the worms eat very readily, grow as big as thoſe that are fed with Mulberry leaves & ſpin as much Silk: They wil alſo eate the hearb called *Dantedelyon*, but whether that will ſo well agree with them as *Lettice*, *I* have not tried, but with *Lettice* they will thrive very well, eating nothing elſe all the yeare.

More Obſervations concerning the feeding of Silk-worms with Lettice,

SIR,

MY good Coſen Mr. *W.* ſent me the letter, you wrote to him; and the note ſent you out of *Ireland*, that intimated the happy ſucceſs the Gentlewoman had then in keeping Silk-worms, not only on the Mulberry-tree-leaves, but with Lettice leaves, the thing you much deſired that my Daughter ſhould have made known unto her. Truly Sir your ſingular humanity and goodneſs in all things more and more extends it ſelfe for the publique benefit of all, and I ſee to the particular ſatisfaction of your Freinds, though Strangers to you yet thoſe that have daily cauſe more and more to honour you, as we juſtly do. Sir, this your favour is both by my-ſelf and Daughter ſo much reſented as it requires from us, very hearty and particular thanks to be tendered to your worth. She is a lover of Rarities in theſe kinds, and to try concluſions upon her Silk-worms, and no way envious, but much rejoyces to hear that any have had that good ſucceſs with Lettice as you write of, and ſhall her-ſelf againe make a third triall in that kind, for ſhe hath 2. yeares laſt paſt tryed her-ſelf to have kept ſome with Lettice leavs & ſo did & they thrivd as well as thoſe kept with Mulberrys, but ſtil when the time of ſpinning came they would not ſpin, but then dyed and this put her out of heart to try further, yet I may tell you, ſhe perſwaded a Gentleman near her to keep ſome with Lettice 25. daies and then fed them with Mulberrys at laſt, and theſe did very well and ſpun as good Bottoms as thoſe wholly kept with Mulberry

leaves. But now she resolves upon your intimation of the experiment made in *Ireland* to try a third time, and to give you an accompt of her success in *June* next, if God permit.

And now Sir she presents this printed inclosed paper to your worthy judgment, if you find not it matter of consideration and reason for her to send it as a second new yeares gift to *Virginia*, hoping that it may do good there to the Planters and informe them of much truth, and invite them to the busines of Silk, which God grant, *Amen.*

This other paper of Ryming lines (for Verses they deserve not the name) yet being that what her Brother a young Scholar hath collected out of Letters, that were sent her from *Virginia* and given her, she also sends you to further informe you of things done, last spring.

Thus worthy, Sir, with the due respects of both our kindest salutes, wishing you all happines in this and the better world, I rest ever.

Yours in all love and service

Littell *Gidding Hunting shire* this 28. *Novemb.* 1653. *JOHN FERRAR.*

SIR,

She makes bold to present you with a sample of *Virginia* Silk-grass sent her by a freind. It's a rarity, and she hopes will delight you who have such a publique Spirit to rejoyce, and further a Common good; as she hath great hopes this will prove a commodity next to the Silk there, as skilfull men and Artists do assure her of it, and thousands of poor people will be set a work with it, if it prove there to be in quantity.

Upon

Upon the moſt Noble, Virginian natural Silk-Worm her wonderful, various, plentiful food; The infinite, ſpeedy, great wealth ſhe will produce to her protector; (in 45. days the time of her feeding) with ſmall labour, coſt, or skill, (learnt in an houres ſpace by any child.) The ſingular aptneſs of that rare Superlative Climate, in Breeding them on ſo many ſeveral kinds of Trees in her Woods where they live, Feed and Spin, their mighty large, ſtrange, double-bottoms of Silk: To the admiration of this our Old World; but to the exaltation and glory of incomparable *Virginia*, in the New.

WHere Wormes and Food doe naturally abound,
A Gallant Silken Trade muſt there be found:
Virginia *excells the World in both,*
Envie nor Malice can gaine ſay this troth.
Many a man the cauſes faine would heare,
How theſe rare Worms came firſt or ſtill come there.
Inſects produced are by heat and moiſture
Who in ſtrange ſhapes and formes do oft appeare.
In Spring our trees the Caterpillers reare;
Their trees likewiſe theſe noble creatures beare.
And ſome proceed from eggs that ſcaped are
From their enemies ſight, which thing is rare.
They feed not only on the Mulberry
Which in our World ſole food is held to be

For all such precious Worms of that degree:
But Popler, Plum, Crab, Oake, and Apple tree,
Yea Cherry, and tree called Pohickery:
So on the Shrubs and Bushes feed full many
Her Worms are huge whose bottoms dare
With Lemmons of the largest size compare.
And twenty one of ours will sure poize less
Then one of theirs for weight and ponderousness.
Master William Wright *of* Nansamound
Found Bottoms above seven Inches round.
And though the Silk prove not all out so fine
As Persian, *that's no let to the designe.*
For since a thousand of our Bottoms make
But one pound of fine Silk, you'l ten pounds take
From theirs. If we at Thirty shillings sell
Our pound, for twenty they'l afford theirs well.
The paines that's taken is alike in either
But the gaines by theirs eight times greater:
Then, we confined are to the Mulberry
For food, their Worms have great Variety.
Her dainty coloured flies and large Worms
In length and bigness do surpass mens Thumbs.
Whereas ours short of little fingers come.
Our flies come out in twenty days and lay
Eggs, theirs not still three hundred as they say
O wondrous thing! a Worm to fast so long
And then come out a painted Fly so strong.
Nine mouths full out our eggs unhatch't remaine
Nine daies in Spring makes theirs revive againe
A Planter (I wish they had him named)
A spoonfull eggs from one fly he gained
Which to five hundred at least amounted
Loe shortly endless they must be counted.

In

In March *they first begin to live and feed*
In Aprill *they have done the Silken deed*
The sweeteſt, pleaſantſt time in all the yeare.
You to this Wealth the chanting Birds will cheare
And ten moneths time they leave you with great eaſe
To ſpend it in what profit you ſhall pleaſe.
Rare Worms who feeding five and forty daies
On leaves of ſundry Plants and ſhrubs repaies
Their keepers with fine Silke which wants no ſtrength
And yet extends it ſelfe ſome miles in lenght
And for the labour of a Man and Boy
They gaine you Sixty pounds which is no toy.
If you from Birds protect them on the trees
(Their naturall manſions) t'will them beſt pleaſe
Your paines is ſpar'd in giving them the leaves
By which alone you gaine their Silken ſleaves
For non-parrel Virginia *in her Woods,*
Brings forth as all men know theſe precious goods:
Where thouſand fleeces fit for Princes Robes
On Virgin-trees ſhall hang in Silken Globes.
The noble Worm ſo hardy, ſtrong and ſtout
No weather ill is able them to rout.
The reaſons why the numbers are ſo ſmall
Leſs Cruell Birds devoure moſt of them all
When they are Worms yea Eggs or Silken ball.
Moſt bottoms likewiſe on the leaves are ſpun
Both falling to the ground do periſh ſoon
Thoſe only found that ſpun are on the branch
Not by their care but providentiall chance
Which only ſhow themſelves when all is bare
To Find in Summer any'tis moſt rare.
If to prevent both dangers you intend
A Reedy-Arbourwell will doe't, you'l find

Or ſlighteſt coverture in any kind
The skill and paines to all each Child can do:
As you ſhall find on triall tis moſt true.
And may in wealth compare with rich Peru.
And for all Tooles that appertaine thereto
A Twelve-peny Reele is all it will coſt you,
No wit, no ſtrength, no purſe, no ſtock will need
But Eies and hands, the Worms to guard and feed.
And thus you ſee done is the Silken deed:
Which brings you ſo great wealth with ſo much ſpeed.
Five hundred pounds worth of rich Silk, all know
Fraights leſs then ten pounds in poore Tobacco
Silkes are no traſh, no toy, nor Pedlars ware;
Staple, good, and ready chinke every where.
Twenty ſhillings a pound t'will yield you cleare
And Ships to fetch it will come flying there.
Queenes of the beſt edition need not ſcorne
In her owne Livery to ſerve this Worm:
Only to give her leaves is all ſhe craves
And in reward with Silk ſhee'l make you brave.
Out of her rich belly by her mouth ſpun
Weaves it into a moſt curious bottom
Which by a Reele turning with hand of man
Is wholly wound off moſt neatly againe.
To feed Silk-Worms no Caling can diſdaine
Seeing they yeild you ſo much honeſt gaine
No imployment in the World ſo likely
To make ſo ſoone your laſie Savage wealthy.
For his Silk bottoms in exchange ſhall have
From Engliſh, what he ſo needs, begs, and craves
Red coats, hoſe, ſhooes, knives, they highly deeme
Jewes-Trumps, Bells, Beads, all toys, no leſs eſteeme.
If all be thus the cauſe you now demand

Why

Why hath this knowledg been thus long detain'd
And but now by the Ladies Books inflam'd
Ignorance of Planters ſo ſtrange hath been
Till now ne're knew nor dreamt of this rich thing
Confeſt it is, that of't ſome they have ſeene
Regardleſly, but ne're did them eſteeme.
Which loſs of Wealth and Honour they'l regaine
And Virgins *Counſell follow will amaine.*
The happy onſet they this Spring have made
Aſſures them all a ſtately pretious trade.
Sir Henry Chichly *that Heroick Knight*
Affirmes ther's not an ingenuous Wight
In Virginia *but makes all ſpeed he can*
To be e're long a Silken noble man.
And ſay, Colonel Ludlow *certifies*
That thence from Silk great profit will ariſe;
Yea worthy Bernard *that ſtout Colonel*
Informes the Lady the work moſt facile
And of rich Silken ſtuffs, made ſhortly there
He hopes that he and others ſhall ſoone weare.
So major John Weſtrope *ſaith, Silk will be*
A gallant deſigne for their brave Country.
Thunder was that, that ſome men onely doubt
But triall made this Spring puts that feare out.
In all Lands where Worms are kept tis wonder
To heare that any were harm'd by thunder.
Their naturall Worm proves this more truer.
Mr. Gorge Lobs *that prudent old Planter*
Tells her that Worms ne're ſpun Silk daintier.
Lets give thoſe Gentlewomen their full dues
Miſtreſs Garret *and* Burbage *for Silk clues*
That Colonells Wife needs not farr to rove
Her Court affords a pleaſant Mulberry Grove:

But noble Diggs *carries the Bell away*
(Lasse! want of eggs made so small the essay)
His two Armenians *from Turky sent*
Are now most busy on his brave attempt
And had he stock sufficient for next yeare
Ten thousand pound of Silk would then appeare
And to the skies his worthy deeds upreare.
Loe here what mistress Mary Ward *hath sent*
And to her Lady Cosin she presents
Ten rare Bottoms took from her Apple tree
That all England may it beleeve and see.
Her honour'd Kins-man Esquire Ferrar,
To confirme and make the wonder greater
Ten more likewise hath sent her, which he found
On stately Oakes and Shrubs that kiss the ground
And Doctour Russell *that learn'd Phisitian*
Hath with his, made a full addition.
For things more slowly do affect the minde
Which eares do heare then those that eies do find.
Now from smoke Virginia *shall be raised*
And throughout the World be duly praised.
Ah Blest be God that now in his due time
This Silken light apparently doth shine
Then come, O come with sacred Lays
Let us sound the Almightys praise

I. F.

To the most Noble deserving Esquire *Diggs*: upon the Arrivall of his two Armenians out of *Turky* into *Virginia*.

Courage, brave Sir: sith Ayde from God is sent
Proceed, go on, drive forth thy great intent.

A Comparison between the gain and labour of TOBACCO *and* SILK.

TObacco requires 9 moneths time, much care and labour, both without and within doores, and a mans Crop is commonly 15 hundred weight of Tobacco, and this at two pence a pound is 14 pound gain.

Silk requires six weeks time, if done in a house, and by the labour of a man and boy, in gathering leaves, and tending the worms that come of six ounces seed, there is by so many worms spun as much Silk as will weigh sixty pound weight, and this but at 20 *shil.* a pound, yeelds 60 *l.* in ready money.

Tobacco, leaves a man but 3 moneths in the year for other businesse.

Silk, leaves a man ten moneths time in the year, for any other imployments.

14 pounds a man gaines by his Crop of Tobacco.
60 pounds a man and boy gains by his Crop of Silk.
Then let all men judge which is the more gainfull.

But what will be the gain and profit, by the worms feeding and spinning on the Trees is more considerable, and also the naturall *Virginia*-worms bottome exeeding ours in *Europe* 20 times in bignesse, and in weight: what a Treasure then will this be, and no labour, cost, hazard, expence of time at all, a Boy onely to keep away the Birds from eating the Silk-worms on the Trees, &c.

This

Thus learned Bartas *upon this noble & admirable Creature.*

YEt may I not this *Wonderous Worm* paſs by,
Of fly turn'd Worm, and of a *Worm a Fly.*
Two Births, two Deaths, here Nature hath aſſign'd her,
Leaving a *Poſthume*, dead-live Seed behind her;
Which ſoon transforms the freſh and tender leaves
Of *Thiſbes* pale tree, to thoſe tender ſleaves
(On Ovall Clues) of ſoft ſmooth ſilken Flax,
which more for us then for her ſelf ſhe makes.
O precious fleece! which only did adorne
The ſacred loins of Princes heretofore:
But our proud age, with prodigall abuſe
Hath ſo profan'd the old honorable uſe:
That Shifters now, that ſcarce have bread to eat
Diſdain plain Silk, unleſs it be beſet
With one of thoſe brave Metals, whoſe deſire
Burns greedy ſoules with an impartiall fire.

Had Du Bartas *fully known all the vertues and rarities in this incomparable Creature, even a miracle in Nature, he would have inlarged his Poems in a more ample manner in the praiſe of it, to the great honour of the Creatour.* Cui Gloria, *Amen.*

Homo Vermis.

Wee all are creeping Worms of th' earth,
Some are Silk-Worms great by birth,
Glow-Worms ſome that ſhine by night,
Slow-Worms others, apt to bite,
Some are muck-Worms ſlaves to wealth,
Maw-Worms ſome that wrong the health,
Some to the publique no good willers,
Cancker-Worms and Cater-pillers;
Found about the earth wee'r crawling,
For a ſorry life wee'r ſprawling,
Putrid ſtuff we ſuck, it fills us,
Death then ſets his foot and kills us.

FINIS.

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